ABSTRACT

The present invention relates to the diagnosis and treatment of diseases such as heart disease and cancer wherein necrosis is a part of the standard course of the disease. The method uses zinc finger proteins and their analogues having a metal chelated thereto, providing appropriate conformation for binding to DNA in necrotic tissue. Medically useful metal ions such as radioisotopes and nuclear magnetic resonance enhancing metals are attached to the zinc fingers.

As a diagnostic tool the uptake of this new class of radiopharmaceuticals pre and post conventional cancer therapy can provide almost instantaneous determination of effectiveness of the therapy and the extent of normal healthy tissue destruction. As a nuclear medicine diagnostic tool in cancer it can provide rapid prognosis and extent of disease on a physiological basis rather than conventional anatomy analysis by computerized tomography (CT) or magnetic resonance imaging (MRI). As a MRI contrast agent it can provide clear distinctions between normal tissue (no uptake) and diseased tissue (uptake). As a therapeutic agent for cancer, the compound bound to DNA in necrotic cells in the layer below the rapidly proliferating layer will irradiate the rapidly growing rim of cancerous cells with beta or alpha radiation.